

Guide Clamp

Field of Invention

The present invention relates to a guide clamp.

Background of Invention

US Patent No. 4394800 discloses a conventional guide clamp G including a bar B, a clamp jaw C secured to the bar B and a shifting jaw S movable along the bar B. The shifting jaw S can be moved towards the clamp jaw C so as to clamp a workpiece W. A rod R and a lever L are used to move the shifting jaw S. The rod R extends through a cavity 22 defined in the bar B. The lever L includes a cam formed at an end. The cam is in pivotal connection with the rod R and in contact with the bar B. Thus, pivotal of the lever L causes the movement of the rod R. The shifting jaw S is attached to the rod R so that the shifting jaw S retains its position relative to or slides along the rod R. The shifting jaw S includes a jaw block 51, a plurality of lock clips 52 and a release carrier 53. The jaw block 51 and the release carrier 53 are both mounted on the rod R in a sliding manner. The lock clips 52 are nested between the jaw block 51 and the release carrier 53 for unitary function. Each lock clip 52 is bent. That is, each lock clip 52 includes an upper portion and a lower portion. The rod R extends in a hole 60 that is defined in the upper portion of each lock clip 52. The holes 60 are sized so that the lock clips 52 easily slide on the rod R whenever they are normal to the rod R, but lock to the rod R whenever they are tipped from the normal position. Referring to Figure 9, the

1 movement of the rod R causes the lower portions of the lock clips 52 to
2 abut a jaw abutment 57 of the jaw block 51, thus tipping the lock clips
3 52 from the normal position. The lock clips 52 therefore lock on the
4 rod R, i.e., thus the shifting jaw S moves, together with the rod R,
5 towards the clamp jaw C so as to clamp the workpiece W. To allow
6 the lock clips 52 to slide on the rod R, the release carrier 53 is moved
7 from the jaw block 51 so that a crossbar 63 of the carrier 53 returns the
8 lock clips 52 to the normal position. However, the locks 52 tend to
9 stick to the tipped position and cause some troubles for an operator to
10 move the shifting jaw S.

11

12 The present invention is therefore intended to obviate or at least
13 alleviate the problems encountered in prior art.

14

15 **Summary of Invention**

16 It is an objective of the present invention to provide an easily releasable
17 guide clamp.

18

19 According to the present invention, an easily releasable guide clamp
20 includes a body, a rod, a stationary jaw, a movable jaw assembly and a
21 cam. The body is for installment on an object. The rod is movable
22 along the body. The stationary jaw is secured to the body for contact
23 with an edge of the object. The movable jaw assembly is movable
24 along the body. The movable jaw assembly includes a movable jaw,
25 several locking plates, a release carrier and a spring. The movable jaw
26 is for contact with an opposite edge of the object. Each of the locking

1 plates includes an upper portion defining an aperture for receiving the
2 rod and a lower portion extending from the upper portion at an angle.
3 The apertures are sized so that the locking plates easily slide on the rod
4 whenever the upper portions thereof are normal to the rod but lock to
5 the rod whenever the upper portions thereof are tipped from the normal
6 position as the upper portions of the locking plates are moved by means
7 of the rod while the lower portions of the locking plates are stopped by
8 means of the movable jaw. The release carrier is movable relative to
9 the movable jaw. The spring is compressed between the movable jaw
10 and the locking plates for returning the upper portions of the locking
11 plates to the normal position. The cam is pivotally connected with the
12 rod for contact with the stationary jaw so that pivotal of the lever and
13 the contact of the cam with the stationary jaw cause movement of the
14 rod along the body.

15

16 Other objects, advantages and novel features of the invention will
17 become more apparent from the following detailed description in
18 conjunction with the attached drawings.

19

20 **Brief Description of Drawings**

21 The present invention will be described via detailed illustration of
22 embodiments referring to the drawings.

23

24 Figure 1 is a front-right-top perspective view of a guide clamp
25 according to a first embodiment of the present invention installed on a
26 table.

1 Figure 2 is an enlarged front-right-bottom perspective view of the guide
2 clamp of Figure 1.

3

4 Figure 3 is an exploded view of the guide clamp of Figure 2.

5

6 Figure 4 is a cutaway view of the guide clamp of Figure 2.

7

8 Figure 5 is a cross-sectional view of the guide clamp of Figure 2.

9

10 Figure 6 is a cross-sectional view of the guide clamp of Figure 2.

11

12 Figure 7 is similar to Figure 6 except for showing the guide clamp in a
13 different position.

14

15 Figure 8 is a perspective view of two guide clamps used together, one
16 on the other.

17

18 Figure 9 is a partially explosive view of the guide clamps of Figure 8.

19

20 Figure 10 is a perspective, cross-sectional view of the guide clamps of
21 Figure 9.

22

23 Figure 11 is a perspective view of a guide clamp according to a second
24 embodiment of the present invention.

25

26 Figure 12 is a partially explosive view of the guide clamp of Figure 11.

1 **Detailed Description of Embodiments**

2 Referring to Figure 1, a guide clamp 100 according to a first
3 embodiment of the present invention is installed on a table 200. The
4 guide clamp 100 includes a body 10 put on the table 200, a stationary
5 jaw 30 secured to the body 10 for contact with an edge 202 of the table
6 200, a movable jaw assembly 40 movable along the body 10 for contact
7 with an opposite edge 201 of the table 200 and an end cap 20 secured to
8 the body 10 for keeping the movable jaw assembly 40 to the body 10.

9
10 Referring to Figure 2, the guide clamp 100 further includes a rod 60
11 movably attached to the body 10 and a lever 50 pivotally connected
12 with the rod 60. At an end of the lever 50 is formed a cam 52 (see
13 Figure 3) for contact with the stationary jaw 30. Thus, pivotal of the
14 lever 50 and the contact of the cam 52 with the stationary jaw 40 cause
15 movement of the rod 60 along the body 10. The movement of the rod
16 60 can cause movement of the movable jaw assembly 40 so as to clamp
17 the table 200.

18
19 Referring to Figure 3, the body 10 includes an elongated form with a
20 first end, a second end, a bottom, a top and two walls. The body 10
21 includes a groove 16 defined in the bottom, two grooves 15
22 communicated with the groove 16 and two flanges 14 each extending
23 below one of the grooves 15. The grooves 15 and 16 all include two
24 open ends. In the top of the body 10 are defined a dovetail groove 131
25 and two grooves 132 between which the dovetail groove 131 is located.

26

1 The stationary jaw 30 includes a first end, a second end, a bottom, a top
2 and two walls. From each of the walls of the stationary jaw 30 extend
3 at least one protrusion 36 near the top, two fins 35 below the at least one
4 protrusion 36 and two blocks 34 below the fins 35. A tunnel 33 is
5 defined in the stationary jaw 30.

6
7 Referring to Figures 3 and 4, the movable jaw assembly 40 includes a
8 movable jaw 41, a release carrier 42 connected with the movable jaw 41,
9 a plurality of locking plates 43 located between the movable jaw 41 and
10 the release carrier 42, and a spring 44 compressed between the movable
11 jaw 41 and the locking plates 43.

12
13 The movable jaw 41 includes a first end, a second end, a bottom, a top
14 and two walls. The movable jaw 14 includes two beams 412
15 extending from the second end of the movable jaw 41 and a fin 414
16 from each of the walls. A recess 415 is defined in the top of the
17 movable jaw 41.

18
19 The release carrier 42 includes a handle 421, a slide 422 extending from
20 the handle 421 and a connector 427 extending from the slide 422. The
21 handle 421 defines an aperture 424. The slide 422 defines a recess 423
22 communicated with the aperture 424. Two wings 425 extend from the
23 slide 422. The connector 427 includes an enlarged end.

24
25 Each of the locking plates 43 is a bent plate with a lower portion and an
26 upper portion defining an aperture 432.

1 To assemble the movable jaw assembly 40, the connector 427 is put in
2 the recess 415. The enlarged end of the connector 427 is on one end of
3 the movable jaw 41 while the slide 422 and the handle 421 are on an
4 opposite end of the movable jaw 41. Thus, the movable jaw 41 and
5 the release carrier 42 are movable relative to but not detachable from
6 each other. The spring 44 and the locking plates 43 are put in the
7 recess 423.

8

9 Referring to Figures 3 and 5, the end cap 20 includes a first end, a
10 second end, a bottom, a top and two walls. A recess 22 is defined in
11 the top of the end cap 20 in order to receive a spring 23. At least one
12 protrusion 25 is formed on each of the walls of the end cap 20 near the
13 top. A wing 26 extends from each of the walls of the end cap 20 near
14 the bottom.

15

16 To attach the stationary jaw 30 to the body 10, the fins 35 are inserted in
17 the grooves 15. The fins 35 are put on the flanges 14. The blocks 34
18 are located below the flanges 14. The at least one protrusion 36
19 extending from each of the walls of the stationary jaw 30 is in frictional
20 contact with one of two walls of the groove 16 so as to keep the
21 stationary jaw 30 to the body 10.

22

23 To attach the movable jaw assembly 40 to the body 10, the wings 414
24 and 425 are inserted in the grooves 15. The installment of the locking
25 plates 43 and the spring 44 is to be described.

26

1 To attach the end cap 20 to the body 10, the wings 26 are inserted in the
2 grooves 15. The at least one protrusion 25 extending from each of the
3 walls of the end cap 20 is in frictional contact with one of the walls of
4 the groove 16 so as to keep the end cap 20 to the body 10.

5
6 The rod 60 is inserted through the recess 22, the aperture 424, the recess
7 423, the apertures 432 defined in the locking plates 43, a tunnel defined
8 in and by the spring 44 and the tunnel 33. The locking plates 43 and
9 the spring 44 are thus mounted on the rod 60. A pin 63 is inserted in
10 an aperture 61 defined in the rod 60 so as to engage with the spring 23.
11 A pin 64 is inserted in an aperture 51 defined in the cam 52 and an
12 aperture 621 defined in the rod 60 so as to pivotally connect cam 52
13 (and therefore the lever 50) with the rod 60.

14
15 Referring to Figure 6, the guide clamp 100 is put on a table 200. The
16 lever 50 is in a releasing position. The upper portion of each of the
17 locking plates 43 extends vertically so that the movable jaw assembly
18 40 is allowed to slide on the rod 60. Just before clamping the table 20,
19 the movable jaw assembly 40 is moved towards the stationary jaw 30 to
20 a position where the movable jaw assembly 40 slightly contacts the
21 edge 201, and the stationary jaw 30 the edge 202.

22
23 To clamp the table 200, the lever 50 is pivoted to a locking position
24 shown in Figure 7 from the releasing position of Figure 6. Because of
25 the cam 52, the rod 60 moves in a first direction to the stationary jaw 30
26 from the movable jaw assembly 40. The rod 60 carries the upper

1 portion of each of the locking plates 43 while the movable jaw 41
2 retains the lower portion of each of the locking plates 43. Thus, the
3 locking plates 43 tilt and lock to the rod 60. The movable jaw
4 assembly 40 locks to the rod 60. The rod 60 moves the movable jaw
5 assembly 40 towards the stationary jaw 30. Therefore, the table 200 is
6 clamped by means of the guide clamp 100.

7
8 To release the table 200, the lever 50 is pivoted to the releasing position
9 of Figure 6 from the locking position shown in Figure 7. Because of
10 the cam 52, the rod 60 moves in a second direction opposite to the first
11 direction. The rod 60 is supposed to make the upper portion of each of
12 the locking plates 43 extend vertically again. Advantageously, the
13 spring 44 pushes and makes the upper portion of each of the locking
14 plates 43 extend vertically again. Thus, the movable jaw assembly 40
15 can slide on the rod 60 again.

16
17 Referring to Figures 8~10, two guide clamps 100 are used. One of the
18 guide clamps ("lower guide clamp") 100 is installed on the table 200,
19 and the other of the guide clamps ("upper guide clamp") 100 on the
20 lower guide clamp 100. The lower guide clamp 100 is capable of
21 clamping the table 200. The upper guide clamp 100 is capable of
22 clamping a workpiece (not shown) or tool (not shown).

23
24 A plurality of connecting devices 70 is used to join the lower guide
25 clamp 100 with the upper guide clamp 100. Each of the connecting
26 devices 70 includes a connecting plate 71, a washer 72 and a bolt 73.

1 The connecting plate 71 includes a claw 711 put in one of the grooves
2 132 of the body 10 of the lower guide clamp 100 and another claw 711
3 put in one of the grooves 132 of the body 10 of the upper guide clamp
4 100. The connecting plate 71 defines an aperture 712. The bolt 73 is
5 driven into the aperture 712 through the washer 72.

6

7 Figures 11 and 12 show a guide clamp according to a second
8 embodiment of the present invention. The second embodiment is
9 identical to the first embodiment except for including two bodies 10
10 instead of one. Two bodies 10 are used in order to enable the guide
11 clamp 100 to clamp a table of a greater than length than that of the table
12 200.

13

14 The bodies 10 are combined with one another by means of a connecting
15 device 80. The connecting device 80 includes a dovetail 83 and two
16 screws 82. The dovetail 83 includes two sections each defining an
17 aperture 81. Each of the sections of the dovetail 83 is inserted in the
18 dovetail groove 131 of one of the bodies 10. A screw 82 is driven into
19 each of the bodies 10 through one of the apertures 81.

20

21 The dovetail groove 131 and the grooves 132 are capable of receiving
22 and retaining therein a fastening element such as the dovetail 83, the
23 claw 711, a nut (not shown) and a head of a bolt (not shown). These
24 grooves all include two open ends through which a fastener can be
25 moved, a bottom and a top narrower than the bottom for trapping such a
26 fastening element. A tool (not shown) can be attached to the body 100

1 by means of such a fastening element. Alternatively, a tool such as a
2 ruler may be directly attached to the body 10 via insertion in the
3 dovetail groove 131, without the use of a fastening element.

4

5 The present invention has been described via detailed illustration of
6 some embodiments. Those skilled in the art can derive variations from
7 the embodiments without departing from the scope of the present
8 invention. Therefore, the embodiments shall not limit the scope of the
9 present invention defined in the claims.

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